

# Development Plasma-based Atomic Layer Etching of Zinc Oxide by Using Tetrafluoromethane Plasma and Dimethylaluminum Chloride

Chien-Wei Chen<sup>1\*</sup>, Chan-Yuen Chang<sup>1</sup>

<sup>1</sup>Taiwan Instrument Research Institute, National Applied Research Laboratories, Hsinchu, Taiwan

\*email : danielchen@narlabs.org.tw

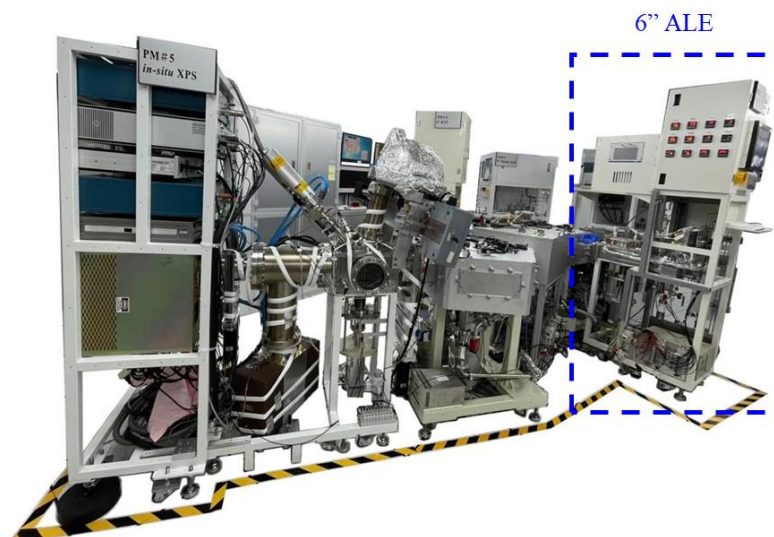


Figure 1. 6" cluster ALE system developed by TIRI

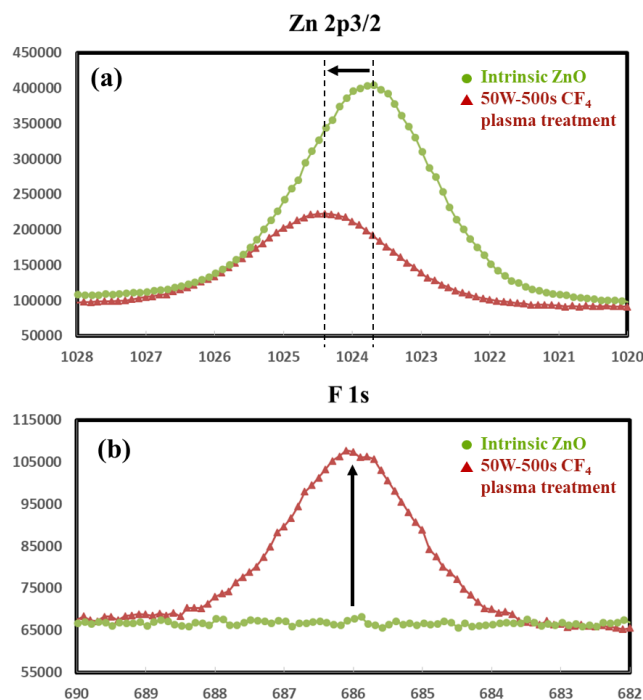
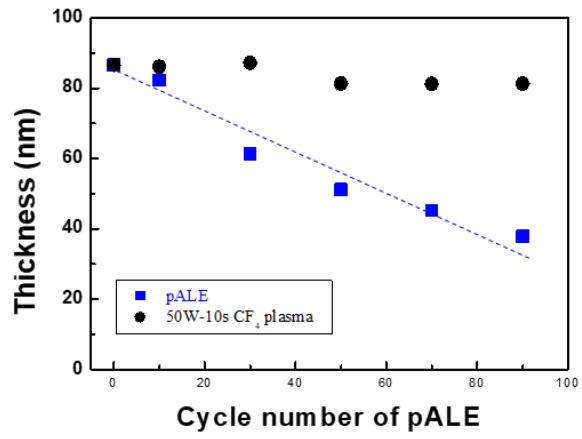


Figure 2. XPS spectra (Al anode) of (a) Zn 3/2p and (b) F 1s of ZnO treated by 50 W-10 s CF<sub>4</sub> plasma for 50 cycles at 0.5 Torr



**Figure 3.** ZnO film thickness vs cycle number of pALE at 400°C